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Measuring financial literacy and its impact on investment decision at household level

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The role of financial literacy in investment decision making at the household level is investigated in this study. The study utilizes OECD/INFE survey questionnaire 2020 to collect data from 286 households in city Sargodha. In general, the findings of the study verify the findings of earlier studies; however, it uncovers some deviations as well. Financial literacy is found to be positively and significantly related to investment behavior. Other significant determinants of investment decision are household's income, age and gender of the household head. The macroeconomic implication of positive relationship of financial literacy with investment behavior is that financial education programs that raise financial literacy results in higher savings at household level and hence the higher level of investment in the economy.
Keywords: Financial literacy, investment decision, Sargodha; savings.

INTRODUCTION

Financial markets around the world are growing rapidly and are offering new products to the individuals. Due to lack of financial literacy, it is difficult for households to manage their retirement products, saving and investment. Households are a group of people living in one place who share a single roof for living and one pot for food. People in one household use the same line of expenditure; the sources of income can be different. Like corporation households also have assets and liabilities sides, they put their assets at home or use different accounts. A household is a decision-making unit, as they have their assets and liabilities, so they are free to make decisions about saving and investment. Households are the actual generator of wealth, asset holdings and liabilities, but there is not a proper way to maintain the records (Lusardi and Mitchell, 2014). Households believe in financial instruments in many ways; they use check, credit cards and cash to pay for the services. When they invest in durable goods, they rely on their behalf as well as on the third party. One of the most important decision household faces is investment. Money is not easy to earn; everyone would like to use it in the safest way (Campbell, 2006).

Two main streams of household finance regarding put their money aside for the future are saving and investment. Individuals realize that saving is the safest way of putting money but not a way of growing money speedily as compared to investment (Selvakumar and Mahesh, 2015). Households who can make good financial decisions about their money are considered financially literate people. While, who are not financially literate, they take the help of financial advisors (Porto and Xiao, 2016).

Financial literacy has gain attention after the global financial crisis 2008-2009. The main reason for this financial crisis was consider the lack of financial knowledge among the individuals. Financial knowledge is one of the components of financial literacy. Financial literacy is very important in one's life because good financial decisions depend on the financial literacy of individuals (Hastings *et al*., 2013). There are some theories that explain the decision-making process. For example, decision theory, theory of mental accounting and prospect theory that provides more insight for investment decision.

Decision theory by North (1968) is about people's need and approach. Two approaches to decision theory are prescriptive and descriptive. In perspective approach, it prescribed that an individual investor should be choose an investment in such a way that it maximizes the expected utility. Descriptive approach describes about the actions of people which they actually do to make an investment that give maximum utility. People make different choices while making investment and they choose in such a way that maximizes their utility.

Prospect theory by Kahneman and Tversky (1979) is about the behavior of the people. This is also known as loss aversion

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theory and put insight on the behavior of the people for perspective gains and losses. Peoples are more conservative about the loss than the gladness of potential gains. Individuals think that loss is difficult to accept than the gain. Prospect theory is more relevant with this study because it identifies how individuals behave in different situations while they face loss or gains. So investors are more willing to exact gain and not willing to take risk.

Theory of mental accounting by Thaler (1985) propounded that individual has some sketch about the investment while they hold some investment with them. Framing a sketch means that investor thinks about the ups and downs about the asset and transact about the gain or loss in mind. This thing gives him utility about the investment. Investors make transactions in case of gain or more loss; this is because they have idea in mind about the investment and rotation of these ideas and losses and gains. The objective of the study is to investigate the relationship of financial literacy and investment decision at household in Sargodha.

The remainder of the study is constructed as follows. Section 2 deals with the literature review. Section 3 discusses the methodology of study and sources of data. This chapter also deals with the formulation of Econometric Models of decision to investment at household. Section 4 focuses on the analysis of the data and describes the main findings of the data analysis. Section 5 concludes this study.

LITERATURE REVIEW

Morgan and Trinh (2019) found a positive and significant relationship with the saving and financial inclusion. Instrumental variables are used to remove the problem of possible endogeneity. Higher education level is the first variable which show a higher relationship with the financial literacy it also affects the financial behavior, saving and financial information. This study shows effect of financial literacy on age, income, saving (high financial literacy people save in formal and informal ways as compare to the low-level financial literacy who only save in the informal ways). This study also shows that the financial literacy and financial information has relationship with the financial inclusion.

A study on effect of income, financial literacy and financial behavior on investment decision is done by Arianti (2018). He collected data from university students of Pamulang. It shows that financial literacy has not significant effect on the investment decision of the investors or households. Financial literacy has partially significant effect on savings. It also concluded that the financial behavior shows positive significant result with the investment decisions. Income also has a positive and significant result with the investment decision.

Yoshino *et al*. (2017) find the impact of financial literacy and some other factors on the saving decision of the households. The study was based on the 25000 individuals in the Japan. They find that the financial literacy has positive and significant effect on the investment decision of the individuals. Financial literacy is positively and significantly associated with the age, income and education level. The results of gender were mixed for different investment avenues. The results were implied that there should be some policies for improving the financial literacy among the individuals. Because financial literacy has positive and significant impact on saving and investment decisions.

Sapataro and Corsini (2017) show that saving, financial literacy, education and investment decisions are correlated with each other. This study also explores some other impacts related to financial literacy those are impact of literacy on stock market participation, wealth accumulation and on saving. Education has positive significant effect on financial literacy. Income has also positive effect with financial literacy in three dimensions. First income and literacy collectively affected by education, second income associated with its degree and third dimension is casual relationship and this is risk aversion leads to higher income and higher income leads towards the more participation in financial products and services.

Kasalirwe and Lokina (2016) carried out a study that whether household investors like to invest in formal, informal, personal entrepreneurship or in agricultural business. They find the relationship between the financial literacy and the investment choice of the household of Uganda. The research reveals that there is a positive association between the financial literacy and the investment choice of the household. Households use the informal investment type more preferably. There is a low level of financial literacy exists in the households and the reason for investing in informal investment is the far flung area of financial institutions from the state.

One of the main factors that Awais *et al*. (2016) explore in the study determines is risk which plays mediating role between the financial literacy and the investment decision. The degree of risk associated with an investment is affected by the financial literacy. The researcher constructs a theoretical model to show the relationship between the risk and the financial literacy. The challenges face by the market participants and especially for households are ambiguity, loss in future and the choice overburdened. Household investors with past experience and financial literacy have more capacity to chase the risk. This is the reason that investors are ready to invest in more risky investment and get higher returns. Financial literacy and past experience affect the investment decisions in the Pakistan.

Wubie *et al*. (2015) analyze and check the effect of demographic factors on the saving and investment decision of the high school teachers in the Dangila Voreda. The result showed that age and social ceremony has negative significant impact and family size and gender has positive significant impact. The other variables marital status, educational level,

occupation and religion these variables were not statistically significant.

Bhushan (2014) shows that individuals who have high level of financial literacy have better knowledge of financial products and services. Awareness level changed from one individual to another with the choice of bank account and other investment avenues. Households whom financial literacy level is low mostly prefers to the safest products like money save in bank accounts rather than to invest it.

Grohmann *et al*. (2014) measured the financial literacy with some instruments, like saving habits developed by parents in their children in early age, education of household or parents, financial education at school level and experience with money. More financially literate people take more risk as compare to less financial literacy people hold.

Lusardi and Mitchell (2014) find out that financial knowledge plays an important role in the saving, investment, borrowing, retirement and other financial decisions. Moreover, there is a low level of financial knowledge available in the households. One way to solve the issue that people face is provide the easy options for the investors that can be easily understood. Because more people found to be financial illiterate and they have no ideas how to save. More emphasis should be on the literacy programs and financial knowledge rather than to check the level of literacy.

Hastings *et al*. (2013) carried out research on financial literacy and financial education's impact on the financial outcomes. The financial education improves the financial literacy of individuals it improves the financial outcomes. There should be some institute or formal way to improve the financial education between the individuals. In United States policy initiatives improve the financial education to improve the financial decision making among the individuals in 1950's and 1960's.

Sireesha and Laxmi (2013) conduct a study in Hyderabad and Secunderabad in India for testing the effect of demographic variables on the selection of investment avenues by investor. They find that maximum numbers of male make investment at age 26-35 with post graduate in degree and in service their annual income round about 5 lakhs. Mostly households of these cities were conservative and prefer to saving rather than to investment. Moreover, they find that income and saving has positive relationship with investment. Friends also effects investment decision of households.

Amisi (2012) conducted a study on all 16 funds manager in Kenya to check the effect of financial literacy that individuals only rely on the pension funds which is a safe way of future money or they move towards other investment options also. Financial literacy is itself an endogenous variable because it has correlation with the wealth of households. Financial knowledge in Kenya has an impact on the saving, risk taking level and to choose between the best investment options rather than to in pension funds only.

Ansong and Gyensare (2012) examines determinants of financial literacy and its affect among the university students of Cape Coast. The emphasis of this study was mainly on two determinants age and work experience. The result of the study is age and work experience are positively correlated with the financial literacy of university students. Moreover, parental education is correlated with the financial literacy at household level.

Hassan Al-Tamimi (2009) conducted research on the UAE investors and households. They find out that financial literacy level of the UAE investors. The value of financial literacy is growing because the innovative products and competition in the market is very high. Financial literacy is low in UAE households. UAE investors have awareness about the diversification of financial products but they do not know about the financial products available in the financial market of UAE. The financial literacy gets impact of the educational level, income and their work. Men found more financially literate than women. Finally, it is found that financial literacy has significant impact on the investment decision of the UAE investors.

MATERIALS AND METHODS

***Empirical Model of Decision to Invest*:** The study investigates determinants of decision to invest (a dummy variable) at household level using financial literacy as independent variables along with the other control variables. The study estimates the following empirical model to investigate effect of financial literacy on decision to invest of the households.

Decision to Invest =

$$\alpha_1 + \alpha_2 \text{ Financial literacy} + \alpha_3 \text{ Income} + \alpha_4 \text{ Gender} + \alpha_5 \text{ Age}$$

***Econometric Strategy*:** Our dependent variable has only two possibilities zero and one. In the study y denote 1 if household has any type of investment and zero in case of no investment. The dependent variable for this study is binary in nature i.e., variables having only two possible outcomes that is "Yes" or "No". The study use probit regression instead of OLS regression.

***Probit Regression*:** In binary response model, interest lies primarily in the response probability

$$P(y = 1|\, x) = P(y= 1|\, x1, x2, x3, \ldots\ xk)$$

Where we use x to denote the full set of independent variables. For example, when y is investment indicator, x denotes the various investor characteristics such as financial literacy, age, gender and income that effect the investment decision.

***Data Collection*:** The target population of this study is the households living in Sargodha. This study used the adjusted OECD/INFE questionnaire of adult financial literacy version (OECD/INFE 2020). The questionnaire includes general information or the demographic information of the

households such as (age, gender and income) and the other questions related to saving and financial literacy.

Data collection was conduct in June 2022. The number of samples was 300 respondents. Out of which 292 responses were correct and 6 more questionnaires were excluded because of the missing income response. Therefore, total of 286 observations are used for descriptive analysis and estimation of empirical model of study.

This study measures the variables using data collected from questionnaire. Income includes the total income of all the household members. Gender of household head include male or female; 1 is for female and 0 is for male household head. Age is the age of respondents. The study measures the financial literacy with its three dimensions

1) financial knowledge
2) financial behavior and
3) financial attitude

Financial literacy is combination of three components that is financial knowledge, financial behavior and financial attitude. Financial literacy score ranges from 1 to 21 as it is sum of three scores. For ease of interpretation, we converted the indicator scores into z-score values:

Z-score = (score – M-score)/ scoresd

where score is the converted Z-score, M-score is the mean score, and scoresd is the standard deviation of the score.

RESULTS AND DISCUSSION

***Descriptive Statistics*:** Table 1 presents summary statistics of variables that are used in the analysis. It indicates that the percentage of households in the sample who invest 44% with a standard deviation of 0.49. The study measures the financial literacy in Sargodha city. Financial literacy average score is 13.31 out of the possible outcomes 21. The percentage financial literacy score in this study is 63.36%. In the OECD countries the financial literacy level is 56.79% in Cambodia, 59.5% in Lao PDR, 60.47% in Viet Nam, 63.33% in Indonesia, 63.80% in Thailand, 60.95% in Malaysia, 58.57% in India, 56.66% in France, 70.95% in Hong Kong, 67.14% in PCR, 66.19% in Korea and 55.23% in Poland.

Table 1. Summary Statistics.

Variable	Mean value	SD	Min	Max
Decision to Investment	0.448	0.498	0	1
Financial literacy	13.315	2.777	6	19
Income	49780.650	40389.430	3000	350000
Age	36.262	10.324	17	66
Gender	0.542	0.499	0	1

Overall average of income is Rs. 49780.65. The average age of respondents is 36 years, the age is overall including men and women. All these results are related with the Sargodha a region of Pakistan. Level of financial knowledge is very low if we compare it with the financial attitude and financial behavior. The financial literacy score in Sargodha is 13.31 out of possible scores 21 which is acceptable if we compare it with the 20 countries in the OECD. In the OECD the average scores were 13.3 our results of financial literacy is higher than the financial literacy scores of 20 countries in OECD which is 13.3.

***Probit Analysis*:** As mentioned in the methodology that study investigated determinants of decision to invest using financial literacy as independent variable in separate regressions along with the other variables in the model. Table 4 presents the regression results for the relationship between financial literacy and the decision to invest of the households. Column investment shows the probit estimates while column ME shows the marginal effect of independent variables on decision to invest. Financial literacy has positive and significant effect on the investment decision of the households. Arianti (2018) found that financial literacy has negative effect on the investment decision. Klapper and Panos (2011); Musundi (2014) and Awais *et al*. (2016) uncover that to make any investment decision an investor needs to make right choice and on right time. Yoshino *et al*. (2017) found that financial literacy has positive and significant effect on the investment decision in Japan.

Financial literacy has positively significant association with investment behavior of households. In UAE in 2009, it was measured that financial literacy has positive and significant association with the investment decision. In Uganda it is found that financial literacy is positively associated with the investment decision of the household. In Viet Nam and Cambodia, the level of financial knowledge is very low which consequently lower the financial literacy. Financial literacy affects investment decisions significantly. It means for improving financial literacy, there is a need to improve financial education or financial knowledge.

Table 4. Probit Regression and Marginal Effects, Dependent Variable: Decision to Investment .

	Investment	ME
Financial literacy	0.0648*	0.0255*
	(2.13)	(2.14)
Lnincome	0.736^{***}	0.290***
	(4.84)	(4.84)
Age	0.0272^{***}	0.010*
	(3.34)	(3.33)
Gender	-0.455^{**}	-0.178*
	(-2.78)	(-2.82)
Intercept	-9.574^{***}	
	(-5.94)	
N	286	

t statistics in parentheses; $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

One standard deviation increase in financial literacy score is associated with an increased probability of some investment

by around 2.5 percentage point in Sargodha's households. It means if financial literacy increases 1 percentage point the household will invest 2.5 times more. Income also positively significant association with the decision to invest. A higher income is also associated with the high probability of investment. A one standard deviation increases in income change the investment decision by 29 percentage point. Age is also positively significant associated with the investment, decision to invest of households. As age increases it increase the decision to investment. Gender is also significant but negative association with the decision to invest. It means females has a lower probability of investment as compare to males.

***Conclusion*:** The objective of the study is to measure the financial literacy and to investigate its effect on the investment decision of households in Sargodha city. For such purpose, study utilizes OECD/INFE survey questionnaire 2020 to collect data from households in city Sargodha. The study measures the financial literacy in Sargodha city. Average financial literacy score is 13.31 out of the possible outcomes of 21 that shows it is relatively better level of financial literacy. It means that households in Sargodha have knowledge about financial products and services so their behavior is positive toward saving and investments.

To estimate the effect of financial literacy on the investment decision of households, the probit model is used. The dependent variable is investment decision of household and independent variables are age, gender, income and financial literacy. Financial literacy has positive and significant effect on the investment decision of the households. Moreover, the study finds that income affect the investment decision of households in Sargodha city. The study also find that age and gender of the household head affect the investment decision of households.

The positive effect of financial literacy on decision to invest requires improvement in financial literacy. That is, there is a need to improve financial knowledge, financial behavior and financial attitude. There is need to implement programs for enhancing the financial literacy among the households.

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***Consent to participate*:** Both authors participated in this research study.

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REFERENCES

Amisi, S.A.R.A.H. 2012. The effect of financial literacy on investment decision making by pension fund managers in Kenya (Doctoral dissertation). University of Nairobi.

Ansong, A. and M. A. Gyensare. 2012. Determinants of university working-students' financial literacy at the University of Cape Coast, Ghana. International Journal of Business and Management 7:126-133.

Arianti, B. F. 2018. The influence of financial literacy, financial behavior and income on investment decision. Economics and Accounting Journal 1:1-10.

Awais, M., M. F. Laber, N. Rasheed and A. Khursheed. 2016. Impact of financial literacy and investment experience on risk tolerance and investment decisions: Empirical evidence from Pakistan. International Journal of Economics and Financial Issues 1:73-79.

Bhushan, P. 2014. Insights into awareness level and investment behavior of salaried individuals towards financial products. International Journal of Engineering, Business and Enterprise Applications 1:53-57.

Campbell, J.Y., 2006. Household finance. The Journal of Finance 4:1553-1604.

Grohmann, A., R. Kouwenberg and L. Menkhoff, 2014. Financial literacy and its consequences in the emerging middleclass (No. 1943). Kiel Working Paper.

Hassan Al-Tamimi, H. A., and A. Anood Bin Kalli. 2009. Financial literacy and investment decisions of UAE investors. The Journal of Risk Finance 5:500-516.

Hastings, J. S., B. C. Madrian and W. L. Skimmyhorn, 2013. Financial literacy, financial education, and economic outcomes. Annual Review of Economics 1:347-373.

Kahneman, D. and A. Tversky, 1979. Prospect theory: An analysis of decision under risk. Econometrica 2: 263-291.

Kasalirwe, F. and R. Lokina, 2016. Financial literacy and household investment choices in Uganda. Conference at Uganda Cristian University.

Klapper, L. and G. A. Panos, 2011. Financial literacy and retirement planning: the Russian case. Journal of Pension Economics & Finance 4:599-618.

Porto, N. and J. J. Xiao.2016. Financial literacy overconfidence and financial advice seeking. Journal of Financial Service Professionals 70:78-88.

Lusardi, A. and O.S. Mitchell, 2014. The economic importance of financial literacy: Theory and evidence. Journal of Economic Literature 1:5-44.

Morgan, P. J. and L. Q. Trinh, 2019. Determinants and impacts of financial literacy in Cambodia and Viet Nam. Journal of Risk and Financial Management 1:19-25.

Musundi, K.M., 2014. *The effects of financial literacy on personal investment decisions in real estate in Nairobi count* (Doctoral dissertation, University of Nairobi).

North, D.W., 1968. A tutorial introduction to decision theory. IEEE transactions on systems science and cybernetics 4:200-210.

Selvakumar, M. and N. M. Mahesh, 2015. A study of investment behavior of households in Virudhunagar District. SDMIMD Journal of Management 2:19-32.

Sireesha, P. and C. Laxmi, 2013. Impact of demographics on select investment avenues: A case study of twin cities of Hyderabad and Secunderabad, India. International Journal of Marketing, Financial Services & Management Research 6:47-55.

Thaler, R.H., 1985. Mental accounting and consumer choice. Marketing Science 4:199-214.

Wubie, A. W., T. M. Dibabe and G. A. Wondmagegn, 2015. The Influence of demographic factors on saving and investment decision of high school teachers in Ethiopia: A case study on Dangila Woreda. Research Journal of Finance and Accounting 9:64-68.

Yoshino, N., P. J. Morgan and L. Q. Trinh, 2017. Financial literacy in Japan: Determinants and impacts (No. 796). ADBI Working Paper Series.